EVALUATION REPORT CLIMATE DIALOGUE

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EXECUTIVE SUMMARY

The weblog **Climate Dialogue** (CD) has been a most controversial climate change communication project, following the Nepperus motion, which asked the government "to also involve climate sceptics in future studies on climate change". The report, commissioned by the Ministry of Infrastructure and the Environment, evaluates the CD project against its multiple goals, to provide input to the discussion on whether to continue with the project.

CD is a moderated blog in which scientists with different perspectives on a climate science related topic, are invited to post blogs, addressing specific questions on the topic posed. At least one of the invited scientists is perceived as a sceptic. The discussions have been quite technical in nature, and, as a result, the audience the blog has attracted is very small and much specialised. The CD project has operated only a year, conducting four dialogues on the natural science of climate change. It has had management problems, and faced fierce criticism from alarmist, mainstream, and sceptic voices in the climate debate. Several goals of the project have been met with limited success, whereas other goals have not been met at all.

With respect to the continuation of the CD project, if the Ministry wishes to:

i. resolve controversial issues,
ii. depolarise the public debate, or
iii. open the scientific discussion to the public,

the project is not a good starting point and cannot achieve these goal in its current set-up. In that case, it is recommended that CD be discontinued.

If the Ministry wants to:

i. help involve sceptic scientists in future climate studies,
ii. identify agreement and disagreement points and reasons therein,
iii. contribute to scientific knowledge by generating new questions,
iv. augment the IPCC process,
v. enhance the dialogue among mainstream and critical scientists,
vi. enable reflection on science communication, or
vii. support thought formation on climate change,

the project has proved a valuable starting point, and can contribute towards these goals, provided that it has adequate management, consistent support and different framing. In that case, it is recommended that the CD be continued.

1 INTRODUCTION

The weblog **Climate Dialogue** (www.climatedialogue.org) has been a most controversial climate change communication project. Attacked as a disaster, or praised as a globally unique experiment, it has raised heated discussions in the blogosphere also about the role of the Dutch government who funded it. After a year of its formal operation the future of Climate Dialogue (CD) is at stake, as the initial funding has finished. The current report evaluates the CD project against its multiple goals, to provide input to the discussion on whether to continue with the project or not.

Climate Dialogue funded by the Ministry of Infrastructure and the Environment, came into being over a year ago, as a direct result of the **Nepperus motion** (Tweede Kamer, stukken 31 793, nr. 54), which asked the government "to also involve climate sceptics in future studies on climate change". That motion reflected the political response in the Netherlands to mistakes identified in the IPCC report AR4 (Working group II), as well as the InterAcademy Council review of IPCC processes and procedures.

This evaluation is conducted at the request of the Ministry of Infrastructure and the Environment, to inform the discussion and decision on whether to continue with the Climate Dialogue project. It has to be stressed from the beginning, that it is **relatively early** to clearly assess the impact of the project at different levels (participants, national debate, scientific endeavour etc). This evaluation aims rather at sketching the dangers and opportunities with the CD project, with respect to different goals.

Even though the explicit goal of Climate Dialogue is to "to explore the full range of views that scientists have on these issues" and "to stimulate the discussion", there are **multiple implicit and explicit goals for CD**, by the organisers, the participants, and broader stakeholders, such as, e.g. improving the relationship between perceived climate sceptics and the government, or providing an overview of debated climate change scientific knowledge. Therefore the aim of this evaluation is to identify the various multiple goals of the project, as identified by

participants as well as broader stakeholders, and evaluate CD against each of these multiple goals. Thus the questions guiding this evaluation is:

- Which are the explicit and implicit goals of the project, according to the commissioning authority and the relevant stakeholders?
- To what extent are these goals have been met by the project?
- Is it recommended to continue the project?
- Which are the possibilities to improve reaching these goals with the weblog?

The evaluation is conducted by Dr. Eleftheria Vasileiadou, Assistant Professor in Science and Public Policy, at the Institute for Environmental Studies, the VU University Amsterdam. The evaluation is conducted on the basis of qualitative analysis of interviews with (a) individuals involved in the organisation of CD, (b) scientists participating in the discussions of CD, and (c) a limited amount of stakeholders around the CD project. This is complemented with the use of basic statistics of the weblog. To conduct the interviews all ethical considerations have been taken care of, ensuring full anonymity for the interviewees, including a signed informed consent form. The evaluation was conducted in November 2013, during which period all interviews were taken: 24 interviews, thirteen of which were conducted in person (face-to-face or Skype interviews), and the remaining eleven via email. These included all active members of the project (ET and AB), and nine out of twelve invited scientists.

2 DESCRIPTION OF CD

2.1 ORGANISATION

From the project website:

"The project organization consists of an **editorial team of three people (ET) and an advisory board (AB) of seven people**, **all of whom are based in the Netherlands**. The editorial staff is concerned with the day-to-day operation of researching topics, finding participants for the discussion and moderating the discussions between the experts. The main task of the advisory board is to guard the neutrality of the platform and to advise the editorial staff about its activities.

Editorial staff

Project leader is **Rob van Dorland** of the Royal Netherlands Meteorological Institute (KNMI). Van Dorland is a senior scientist and climate advisor in the Climate Services section and is often operating at the interface between science and society.

The second member of the editorial staff is **Bart Strengers**. He is a climate policy analyst and modeler in the IMAGE-project at the PBL Netherlands Environmental Assessment Agency (PBL) and has for many years been involved in the discussion with climate sceptics.

The third member is **Marcel Crok**, an investigative science writer who published a critical book (in Dutch) about the climate debate.

Advisory board

Gerbrand Komen is chairman of the advisory board. Before his retirement he was the research director at KNMI and between 2002 and 2007 headed the Netherlands' IPCC delegation.

The other six members of the advisory board are:

Appy Sluijs is an Assistant Professor in the Biomarine Sciences group, at the Institute of Environmental Biology, Utrecht University.

Bart Verheggen works as a scientist in the group Environmental Assessment of the Energy research Centre of the Netherlands (ECN) on various climate and air quality related projects. Verheggen is also an active blogger on climate science.

Peter Siegmund is a senior scientist and secretary of the Climate and Seismology department at KNMI.

Theo Wolters is the owner of an engineering company. He has a long-time interest in both climate and energy issues and he was the one who came up with the idea and the format for the Climate Dialogue platform back in 2010.

Jos de Laat is a post-doc researcher at KNMI who works on remote sensing of atmospheric constituents, but who has also published on other climate science topics like the interpretation of temperature measurements and philosophy of climate science.

Jaap Hanekamp is assistant professor at the Roosevelt Academy, teaching chemistry and the philosophy of science, and is adjunct faculty member of the University of Massachusetts Amherst School of Public Health and Health Sciences, department of Public Health, Environmental Health Sciences. He also has his own research company (HAN-research)."[1]

After the first dialogue, one of the members of the editorial board, Bart Strengers (PBL), left the project temporarily (sick leave), and another member substituted him in the editorial board: Bart Verheggen (until then member of the editorial board), also hired through PBL. In the last months of the project Bart Strengers started contributing again. In addition, Appy Sluijs also ended his participation in the AB because of time pressure.

2.2 Approach

CD is a **moderated blog** in which scientists who have published on the specific topic under discussion, but with different perspectives on the topic, are invited to post blogs, addressing specific questions posed in advance by the editorial team. At least one of the invited scientists is perceived as having **sceptical, or rather critical point of view** on mainstream natural science on climate change. The discussions are quite **technical in nature**, as they go deep in the data, methodology and type of analyses on the topics, also often citing scientific literature.

The blog CD has the following approach: one topic is introduced by one member of the editorial team, and the (three) invited scientists are asked to provide their contributions to concrete

[1] http://www.climatedialogue.org/about/organization/

questions guiding the topic. The scientists start the discussion by reacting to each other's arguments moderated by one of the members of the editorial team (invited experts thread). Once the discussion has reached the point where it is clear what the discussants agree or disagree on and why, the editorial staff decides to round off the discussion.

The initial aim was that, to round off the discussion on a particular topic, the Climate Dialogue editor would write **a summary, describing the areas of agreement and disagreement among the discussants**. The participants would be asked to approve this final article, the discussion between the experts on that topic would be closed and the editorial staff would open a new discussion on a different topic. As discussed below (section 2.4) only one such summary has been made public so far.

The public (including other climate scientists) can comment on the blog, but these comments are shown in a separate space (public thread), below the expert thread. These comments are moderated by a member of the AB, and if they are judged impolite, indecent, irrelevant to the main topic, or relating to the people involved and not the topic, they are shown in a third, different thread (off-topic comments)[2].

In the first year, **four topics** have been discussed in Climate Dialogue, indicated in the table below, together with the discussants, and the number of public posts generated[3].

[2] In fact these off-topic comments are not immediately visible, unless one actually clicks on them.
[3] Note that these do not reflect the amount of individuals posting in the public thread, because there is, as expected, a skewed distribution, with few individuals contributing a lot of posts, and most individuals contributing fewer posts.

Topic	Discussants	Number of reactions in public thread[4]
Melting of Arctic sea ice (November 2012)	Walt Meier (USA) Judith Curry (USA) Ron Lindsay (USA)	168
Long term persistence and trend significance (April 2013)	Rasmus Benestad (Norway) Demetris Koutsoyiannis (Greece) Armin Bunde (Germany)	44
Are regional models ready for prime time? (May 2013)	Bart van den Hurk (The Netherlands) Jason Evans (USA) Roger Pielke Sr. (USA)	9
The (missing) tropical hotspot (July 2013)	Carl Mears (USA) Steven Sherwood (Australia) John Christy (USA)	28

Table 1: Discussed topics, participants and visibility

2.3 Audience

The blog had in total 19,883 unique visitors, while most of the traffic was generated in the first two months of the project[5] (see also Appendix I, Pages). This indicates that the initial interest in the CD blog decreased sharply.

Given the level of technicality of the site's contents, the amount of unique visitors should not be considered very low. Given the selected format (discussion among scientists), the main audience of the blog is not the general public, but **experts on the topic**, either scientists with professional experience on the topic, or individuals with technical background and interest in the topic. It has to be noted that the amount of individual experts on each specific topic is not very large anyhow. In addition, the blog actually succeeded in engaging some **influential scientists** in the public thread discussion, as suggested by the respondents.

[4] Until November 20, 2013. Off-topic comments are not included.

[5] Data until November 13, 2013. If an individual logged in from 3 different PCs or laptops, it would be registered as three unique visitors.

Finally it is rather unique for the blogosphere, as acknowledged by the participants, that visitors were from **different sides** of the spectrum on the climate science debate (perceived as sceptic, perceived as mainstream, and perceived as alarmist), whereas the common practice is that most blog visitors select blogs which fit their own perspective. In this sense, the audience of CD was diverse, which is reflected both in the posts in the public thread, as well as the links that generated the traffic to the blog, even though the traffic from perceived climate sceptics' blogs was higher than the traffic from mainstream blogs (Appendix II, All traffic).

2.4 Challenges

During its operation, the project faced a number of challenges, briefly outlined below.

2.4.1 Time delays

All respondents involved in the organisation of CD indicated that the time required to organise each discussion was substantially longer than initially anticipated, which resulted in lengthy delays in the operation of the blog. This related to reasons both internal to the CD team (ET and AB), as well as external. The most important reasons for time delays in the project seem to be **internal disagreement on framing of each topic**, and difficulty of enlisting participants, which is described below, as it also constituted one of the main challenges.

Members in the editorial team and Advisory Board had lengthy discussions on the exact formulation of the introductory text for each of the discussions, as well as the precise questions to be asked to the participants. This could have been anticipated, since the actual constitution of both ET and AB were on the basis of having different perspectives on the climate change debate in the Netherlands. These perspectives provided ready-made frames for most of the involved members through which they approached each topic. As a result, there were lengthy discussions and negotiations before the final agreement on a text. It has to be noted that, despite lengthy disagreements and arguments, the atmosphere in the project and the collaboration was described as positive by most ET and AB members.

2.4.2 Enlisting participants

The project encountered **difficulties with enlisting participants among the perceived "mainstream" scientists**. The reasons behind this are multiple, among which:

(a) time pressure of invited scientists, as participation in CD is a time-consuming exercise without any immediate reward (operating under the publish-or-perish pressure of the current science system), especially in a period that the WGI AR5 was being finalised

(b) negative publicity and outright criticism that the blog received among influential mainstream and alarmist scientists, for instance James Hansen. The blog has been criticised for giving prominent airing to viewpoints which are not widely supported. As a result many scientists shy away from it.

(c) perceived fear of the medium, as there are a number of polarised blogs, in which climate scientists across the spectrum have been attacked for their work and beliefs. Blogs have been used extensively by the climate sceptics to criticise mainstream climate scientists and scientific findings. As CD is also organised in a blog, some participants were reluctant to engage in a discussion that could spark criticism.

As a result of this, a number of topics were identified and selected for the blog by the team, but were then abandoned, because no relevant scientific expert representing the mainstream point of view was willing and available to participate.

2.4.3 Finalising summaries

The initial objective of the blog was, after moderating the discussion among the three scientific experts, to "produce a summary report which would clarify where the experts agreed, where they disagreed, and what the underlying reason for the disagreement is" (project plan). In fact, this summary of the discussions was expected to be made accessible in the form of a brochure in Dutch (project plan). So far, there is **only one summary published online**, of the first discussion on the potential causes of the melting of the Arctic sea ice. This summary outlines in the form of statements the agreement and disagreement points of the participating scientists, and provides some indication about the underlying reason of the disagreement, without explicitly elaborating on this.

Final summaries are not available for the three other topics (even though some draft summaries have been produced but not agreed upon), mainly because of the large amount of time required to produce such summaries. Time delays (because of lengthy discussions, and problems of enlisting participants) resulted in ET and AB members opting for initiating new discussions (to keep the site going, as a respondent mentioned), as opposed to writing summaries for finished

discussions. Here the impact of the fast pace of the medium itself (blog) is becoming very obvious.

In addition, some discussions were not moderated effectively, which made it even more difficult to produce summary documents. Interviewees commented on how difficult it was to moderate the discussion, and make the invited scientists stick to the question at hand. Especially the discussion on long-term persistence was commented as unsuccessful with respect to keeping the invited scientists to the actual question. As a result the discussion was less focused, which made it difficult and time-consuming to summarise.

2.4.4 Blog dynamics

Finally a set of challenges resulted from the dynamics of blog communication. The set-up of the blog is a strictly moderated blog, which would ensure that comments from the public would relate to the topic under discussion, and would not be personal, political, indecent, or irrelevant to the topic at hand. As the intended audience of the blog is international, the discussants in the public thread are also international. In fact, most site **visitors are from the USA, the Netherlands, United Kingdom, Canada and Australia** in decreasing order (Figure 1, below; see Appendix III, Location).

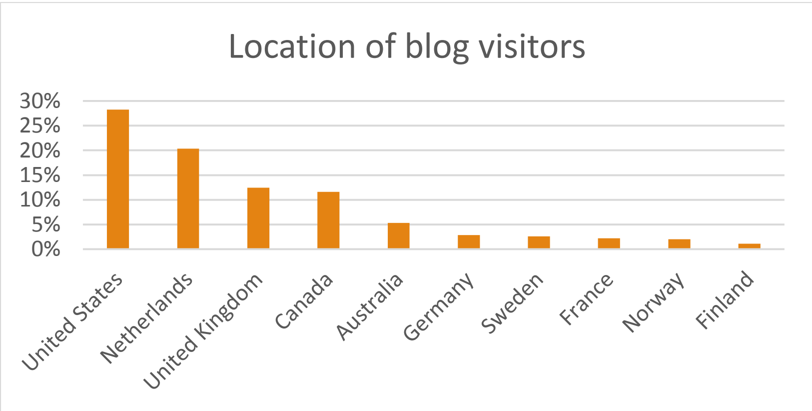


Figure 1: Percentage of total visits to the blog, per country of visitor[6]

The different time zone of these countries, means that some participants in the public thread had to wait for long to see their post online. This is contrary to standard practice in social media, and would demotivate these participants from posting again. Thus, this created a challenge for the members who were working in the Netherlands, most of them also with other work tasks.

[6] Based on the total amount of visits.

2.4.5 Unbalanced effort

The functioning of CD demanded a lot of time and effort for the members of ET and AB. Including different perspectives from the beginning in both teams meant, as discussed above, that selecting the topics, the actual phrasing of the introductions, the questions, led to a great deal of negotiation and debate. In addition, finding participants took more time than anticipated. According to all participants involved, some members of the ET and AB were more active than others, spending more time and energy on conducting the dialogues, communicating with scientists, and moderating the discussions. In this sense, the work in CD was not perceived as equally balanced among ET members, nor was it equally balanced among all members of AB.

Because of these interlinked challenges, the continuation of the project was threatened at points, for instance with respect to **organising a constant stream of discussions**, and to creating a dedicated audience. As a result the internal division of tasks among ET and AB was at points changed, for instance, members of the AB took over the task of drafting summaries for finished discussions. This was perceived as necessary by some respondents, but problematic by others who suggest that the Advisory Board needs to keep more distance from everyday activities of the project.

3 PERCEIVED GOALS AND CD CONTRIBUTION

3.1 INVOLVING CLIMATE SCEPTICS IN FUTURE STUDIES

The first, explicit aim of the blog is to fulfil the Nepperus motion (Tweede Kamer, stukken 31 793, nr. 54), which asked the government 'to also involve climate sceptics in future studies on climate change' (revised Nepperus motion) or, in the original, 'to also involve climate sceptics in future reports of the IPCC'.

The blog organisation involves a critical science writer on climate change, and in the public discussions there are several critical/ sceptical arguments raised. In addition, at least one of the invited scientific experts for each topic is a scientist perceived as sceptic. These invitees are actually some of the most outspoken sceptical scientists. So, with respect to *involvement of individuals perceived as sceptics*, the blog has reached this aim.

With respect to involving them in *future studies on climate change*, the blog has been less successful. The only known and direct impact of CD on climate studies is the use of the 3rd discussion (on regional models) in the KNMI climate scenarios[7], where it was used mainly to "sharpen the view on the (limitations of) the validity of using imperfect (regional climate model) tools to make these scenarios" (respondent 17).

Thus, CD has succeeded in involving the arguments of one sceptical scientist only in one study on climate change until now. It is early to fully assess the success of CD on this goal.

3.2 IDENTIFYING AGREEMENT AND DISAGREEMENT POINTS AND REASONS THEREIN

The initial aim of the CD blog was to round off each discussion with a summary, approved by all invited scientists, which would outline agreement and disagreement points, and indicate the reasons behind the disagreements. Interestingly, this function is perceived as valuable by most respondents, independently from their background or perspective. Up to now, only one such summary has been published (first discussion, Arctic sea ice), because of time delays, and difficulties with moderation (see section 2.4). This existing report is hinting, but not explicating the reasons behind the disagreements of the participating scientists.

[7] To be published in 2014

Therefore, identifying agreement and disagreement points has been successfully achieved in one case only, whereas CD has not succeeded in explicating the underlying reasons for the disagreements.

3.3 Resolving controversial issues

Linked to the previous goal, the implicit goal of CD for some participants is to "reach convergence" on some topics, or "slowly closing topics down, so actually resolving them", or addressing "open questions on climate science that have to be resolved". This expectation is based on the assumption that disagreements on scientific issues such as the missing or not tropical hotspot, or disagreements behind the reasons for the melting of the Arctic sea ice, are based on getting "the facts wrong". Under this assumption, once we get the facts, the theory, the data, the methodology, and the analysis right, then there is one possible answer to each specific question, and this answer would resolve all current disagreements.

The field of science and technology studies (STS) has indicated the socially contingent manner in which the objects of science are constructed and how knowledge about these objects is socially validated[8]. Scientific disagreements are rarely based on differences in facts, but on a number of social and cultural reasons. Facts never speak alone, unless they are put in a context: a theory about how the climate system works, in a statistical treatment (with specific underlying assumptions), in one's worldviews about the role of the government[9]. Differences in confidence in models and the quality of data, different views on what science is and how it should operate, and personality traits, such as emphasising on risk or uncertainty, are among the factors that bring about and sustain these disagreements in the field of climate science[10]. As such, the quest for convergence will remain futile, as long as the discussion in strictly related to technical scientific issues.

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[8] Demeritt D. (2006), Science studies, climate change and the prospects of constructivist critique, Economy and Society, 35(3), 453-479. For an extensive elaboration of this point the most authoritative sources are Latour B. (1987), Science in Action, Cambridge: Harvard University Press; Latour B. and Woolgar S. (1979), Laboratory life. The construction of scientific facts, Princeton: Princeton University Press; Collins H. and Pinch T. (1993), The Golem: What everyone should know about science, Cambridge, Cambridge University Press, Jasanoff S.

[9] Apart from the above see also Collins H. (1985), Changing Order. Replication and Induction in Scientific Practice, The University of Chicago Press

[10] Hulme M. (2009), Why we disagree about climate change. Understanding Controversy, Inaction and Opportunity, Cambridge, Cambridge University Press

Indicatively, from the participants in the discussions and the involved members (ET and AB) only one interviewee (from eighteen) mentioned that he/she changed to an extent prior opinion on the topics discussed. Most participants, from either side of the spectrum, mentioned being confirmed on their opinions after the discussion.

Therefore, CD has not been successful at reaching convergence, or resolving open issues. In fact, the format of CD does not allow for such resolving, since the differences are only partly about facts.

3.4 Contributing to scientific knowledge

For some respondents, the implicit goal of CD was to contribute to scientific knowledge, either by reaching convergence and resolving issues, as mentioned above, or by bringing clarity to the scientific debate, especially emphasising the reasons behind the participants' disagreements. In fact, a few interviewees suggested that the output of these dialogues should be published in a scientific journal, as a publication co-authored by the discussants. This could provide a motivation for scientists to participate in such exercise, which is time-consuming and for which there is no immediate reward.

CD has had limited success so far at contributing to scientific knowledge, first because of the lack of most summaries of the discussions. Second, most of the arguments of the invited scientists were already published in the relevant literature. This means that there is little novelty in the discussion. The contribution to the KNMI scenarios is the only known input at the scientific level so far. CD could potentially contribute to scientific content, if the summaries of the discussions provided new questions; so instead of the debate providing answers, providing new questions which could be further pursued. This could in principle provide added scientific value to the discussions, and maybe even guide science programming: which questions remain open and for which issues can we put additional research effort. CD has not yet succeeded in doing so.

Related to the contributions to science, a perceived goal of CD is to filter critical scientific voices from more public sceptical arguments, in such a way, so that they can potentially contribute to identification of possible mistakes in the natural science of climate change. In this view, climate science needs scientists being critical, and attempting to falsify mainstream held views, because that is how science progresses. CD is expected thus to function as

providing “checks and balances” for climate science, giving critical scientists a podium to air their work, together with scientists presenting more mainstream accepted work. However, there is no indication it has succeeded in this so far.

3.5 Enhancing the dialogue between mainstream scientists and sceptics/ depolarisation

Another implicit aim for some participants has been that CD would enhance the dialogue between the so called mainstream scientific community and sceptics, reducing criticism and polarisation. With respect to this, CD has had limited success. First, because it has received criticism from all sides of the climate debate spectrum (more mainstream views, more alarmist views, and even sceptic views). The critique has been especially strong from alarmist and mainstream scientists and non-scientists, as it has been perceived to provide credibility to climate sceptics, and to create the (misleading) perception that there is an equal amount of scientists supporting the scientific positions portrayed (identified as “false balance” by interviewees). This critique also rests on the framing of the CD itself as one of the projects of the government aiming to “also involve climate sceptics in future studies on climate change”[11]. Some sceptic blogs also criticised the project for not being critical enough. Even though the main responses to the CD were negative, it has to be noted that there were some, fewer, positive responses.

However, CD has succeeded in providing a forum for a polite, civilised discussion[12] between the invited scientists of different perspectives, and the (limited) public contributors. Indicatively, most of the invited scientists were fairly positive about their debating experience, and most indicated they would participate again in a similar discussion. These scientists should not be viewed as representing a community; rather they provide their individual input in a mostly technical discussion.

CD has had a limited spill-over effect on other blogs with respect to the content discussed: there is limited indication of (parts of) the debate and arguments used in CD stimulating

[11] http://www.climatedialogue.org/about/climate-dialogue/

[12] There was no flaming evident in the blog, and there was hardly need of moderation of the public comments, as suggested by participants. Only during the first discussion were there many off-point comments.

debate in other blogs. However, it has sparked considerable debate with respect to its format and aims, as negative criticism from most mainstream blogs.

In addition, even though the members of ET and AB had different views on the topics, and often disagreed strongly with each other, the collaboration atmosphere was perceived as positive, and their collaboration in the project has decreased internal polarisation to an extent. This was especially perceived during the last dialogue organised in July, and it seems to be related to a reflection process among the members (circulation of an advice text from the AB to ET). It is also possible that a learning effect occurred among members of the team: after one year of heated debate, individual members could get along better, and could respect each other's viewpoints.

Thus CD has partially succeeded in decreasing internal polarisation among the members of the project, as well as among the invited participants, and the (limited) contributors to the public thread. It shows its visitors that a polite and civilised debate on the natural science of climate change is possible. There is no indication of the CD contributing to depolarisation of the public debate in the Netherlands.

3.6 Augmenting the IPCC

A perceived objective mentioned by few respondents related to presenting as wide a range as possible of scientific perspectives in the natural science of climate change. The important function here is the mapping of the widest possible range of views, mapping the "legitimate bounds of the discussion", and not being representative of views, that is, how many scientists would agree to the views. The weblog in this sense can serve as a reference point for other scientists, and science assessors, identifying differences in views.

This function is mentioned in relation to the Intergovernmental Panel on Climate Change (IPCC). As the IPCC is perceived by some as not taking fully into account critical science, it is considered important that there is a different, legitimate venue to presenting a range of scientific arguments in the natural science of climate change, "not superseding the IPCC, but augmenting it" (respondent 15). In addition, according to this view, it can help as a resource to IPCC itself; for people who are not following actively the primary literature, CD can help as a resource, a pointer of what are the different views, and whether they are reflected in the IPCC report, without having to delve into the published literature.

With respect to this, CD has been somewhat late to have an impact in the IPCC AR5 (Working Group I). However, as national agencies, particularly in the Netherlands, are now working on consolidating, and translating the IPCC AR5 in the national research and policy needs and national contexts, CD discussions are perceived as a useful resource to quickly identify disagreement points. In addition, as the nature of the future reports of IPCC is being currently discussed, CD can be a valuable reference point for these "legitimate scientific bounds of the discussion".

Referring to the widest possible range of opinions, the success of the CD has been that it has managed to engage in the discussion some of the most influential critical scientists. On the other hand, more alarmist voices, e.g. scientists indicating that climate change impacts can be worse than thought by most, were also perceived to be absent from the blog, even though some have been invited. In general, most the participating scientists and organising members (ET and AB) think that the range of views on the four topics was fairly good, while a few indicated that more alarmist voices were indeed missing.

In short, with respect to this goal, there is no indication that CD has succeeded in augmenting the IPCC.

3.7 Opening the scientific discussion to the public/ science communication

One of the perceived goals of CD is making the scientific debate on specific topics more transparent by bringing it in an open online forum, to policymakers, NGOs and the public at large. The assumption behind this is that public engagement with climate science can enhance the level of the debate. In this respect, CD has not succeeded well. The technical jargon of the discussions does not facilitate public engagement, nor does the absence of a (somewhat simplified) public summary. In addition, CD does not reflect the scientific discussion, rather the range of different perspectives on a topic.

On the other hand, CD managed to bring these discussions to an expert audience (either professional or lay experts), an audience that was already frequenting relevant blogs. It is most likely that such an audience is already aware of the different arguments, and perspectives around the climate science topics discussed. However, CD provides a new

avenue where these different arguments can be presented together: most of these individuals frequent the blogs that conform to their own points of view, so get exposed mostly to "one side of the story".

Related to this, is the function of CD in helping more mainstream climate scientists realise the dynamics of science communication, understanding how the communication of their results can raise questions and criticism or doubt, and in learning how to address this. From the organisers (ET and AB) and the participating scientists, five (from eighteen) respondents suggested that they learnt something from their experience with respect to communicating to a broader audience (science communication), or being exposed to "the other side". This is presumably because the participating scientists were already scientists who were interested in, and to an extent familiar with, science communication, otherwise they would probably not have accepted participating. So CD has had limited success with that.

Thus CD has not succeeded in opening up the different scientific views to the public, but has mainly addressed an already knowledgeable public, which would have otherwise frequented a mostly one-sided blog (see section 2.3).

3.8 Supporting thought formation on climate science

A last perceived goal of CD was to "support individuals forming their own opinion on climate science, in addition to discussions in the scientific literature" (project plan). As stated above, the audience of CD is not the broad public, but already knowledgeable individuals, professional or lay experts on the discussed topics, most of whom have already an informed opinion on the topics discussed. It is unclear to what extent CD has supported thought formation among this audience.

Among the organisers and invited scientists, twelve of eighteen respondents suggested they did gain more knowledge on the topics discussed, five of whom explain that they gained better understanding in the framing of "the other" side, whereas seven respondents did not gain any knowledge on the topics. So CD has had moderate success in contributing to knowledge acquisition and thought formation among some of the participating members.

The table below summarises the discussion in this section.

GOAL	LEVEL OF SUCCESS	INDICATION
Involving climate sceptics in future studies	Limited success	Inclusion of arguments of sceptical scientist in KNMI scenarios
Identifying agreement and disagreement points	Limited success	Available in one out of four dialogues
Identifying reasons behind disagreements	No success	
Resolving controversial issues	No success	
Contributing to scientific knowledge	Limited success	Inclusion of arguments of sceptical scientist in KNMI scenarios
Enhancing the dialogue between mainstream scientists and sceptics	Limited success	Among contributors to the blog Among members of CD
Depolarising general public debate	No success	
Augmenting IPCC	No success	
Opening the scientific discussion to the public	No success	
Enable participants' reflection on science communication	Limited success	Acknowledged by some participants
Supporting participants' thought formation on climate science	Moderate success	Acknowledged by most participants

Table 2: Summary of evaluation against perceived goals

4 RECOMMENDATIONS TO THE MINISTRY

The CD project has operated only a year, conducting four dialogues on the natural science of climate change. It has had management problems, and faced a lot of criticism from different sides. This evaluation is preliminary at best, as the impact of CD cannot be fully assessed at this early stage.

With respect to the continuation of the CD project, it is suggested that, if the Ministry wishes to:

- resolve controversial issues
- depolarise the public debate
- open the scientific discussion to the public

CD is not a good starting point and cannot achieve these goal in its current set-up. In that case, it is recommended that CD be discontinued.

If the Ministry wants to:

- help involve sceptic scientists in future climate studies
- identify agreement and disagreement points and reasons therein
- contribute to scientific knowledge by generating new questions
- augment the IPCC process
- enhance the dialogue among mainstream and critical scientists
- enable reflection on science communication
- support thought formation on climate change

CD has proved a valuable starting point, and can contribute towards these goals, provided that it has adequate management, consistent support and different framing (see structural and implementation recommendations below). In that case, it is recommended that the CD be continued.

In order to contribute to these goals, some recommendations are made. Some of them are structural, and are targeted towards the Ministry of Infrastructure and Environment.

Structural:

- A long term perspective should be provided for CD by securing funding for the following two years. This will enable the scientific community, which is the main audience, to take it seriously, and would help participation of mainstream scientists in the discussion.
- Full and organised support should be provided, and scientists in governmental agencies should be motivated to participate, if they wish to, by, for instance, allowing internal hours to participants.
- Communication about CD should relate to the goals it aims to achieve.
- The governance structure should be changed:
    - There should be one chair, an authority figure from either KNMI or PBL, not assigned, but fully motivated to the goal(s) of CD, which would ensure neutrality, continuity, authority and quality.
    - The Advisory Board should be enhanced to also include input from social sciences, especially science and technology studies and/or environmental communication, as the main relevant fields which can provide input to the project.
    - With the current financial provisions, a two-people editorial team (one mainstream and one sceptic/ critical) should be set, for the day-to-day implementation of the project, both of whom need to be in the Netherlands. It is imperative that the ET can meet regularly to ensure smooth and efficient collaboration, and that both can dedicate a considerable amount of time, both of which are necessary given the pre-existing disagreements on the topics[13].

[13] The suggestion from some participants that one of the ET members needs to be based in the USA, because the main scientific audience is there, while the de facto most active member is in the Netherlands, endangers the project which may lean towards the most active (sceptic) side. This would be especially true since the other ET member would be a newcomer to the project.

- Fully motivated participants from the previous stage should maintain their position, to benefit from the learning effect in the first year of the project, for instance as AB members, or supporting ET tasks.

Below are some recommendations which relate to everyday activities of the project, and how the dialogues should be implemented.

Implementation:

- Providing concise and timely summaries should be the priority over all other tasks.
- The topics and a limited number of focussed questions on them should be selected in advance, with the help of expert scientists, for instance in KNMI, PBL.
- Strict moderation should be conducted, streamlining the discussion on the agreed-upon narrow questions.
- On the blog it should be clearly communicated that it is not representing level of support for the different views exposed, addressing the 'false balance' criticism.
- The blog should be actively promoted, for instance scientific publishers can be approached to explore the possibility of co-authored publications, which could also motivate participants.
- Enough time for the invited participants to respond adequately should be allowed. The sense of urgency inherent in the format of the blog should not dictate the pace of interaction. It is an interaction among scientists, so there is no need for 24/7 mediation, as the main goal is not fast pace, but participation and accurate argumentation.